

Viral Hemorrhagic Fevers: Information for Health Care Providers

☐ **Epidemiology and Microbiology**

- ✓ Viral hemorrhagic fevers (VHF) are caused by a group of single-stranded RNA viruses from four families: Arenaviruses, bunyaviruses, filoviruses, and flaviviruses.
- ✓ Humans are infected via the bite of an infected arthropod, inhalation of rodent excreta, or contact with infected animal carcasses.
- ✓ Person-to-person transmission is possible with several agents, primarily through blood or body fluid exposure, and rarely, via airborne transmission.

Viral Hemorrhagic Fevers and Bioterrorism

- ✓ Agents of concern for potential use as a biological weapon include the arenaviruses, filoviruses, hantaviruses, tick-borne hemorrhagic fever viruses and yellow fever.

☐ **Clinical Presentation**

- ✓ All agents have an initial febrile prodrome with non-specific symptoms: headache, malaise, fatigue/exhaustion, arthralgia, myalgia, nausea, dizziness, non-bloody diarrhea.
- ✓ Clinical signs reflect vascular involvement with increased capillary permeability.
- ✓ Ebola, Marburg, Rift Valley fever, and Crimean-Congo hemorrhagic fever viruses can cause disseminated intravascular coagulation (DIC); other viruses generally do not.
- ✓ Illness onset is typically abrupt with filoviruses, flaviviruses, and Rift Valley fever, and more insidious with arenaviruses.
- ✓ A maculopapular rash appears about five days after onset of illness caused by filoviruses.
- ✓ Jaundice may be prominent in filovirus infections, Lassa fever, Rift Valley fever, and yellow fever.
- ✓ Meningoencephalitis can occur in Rift Valley fever, Kyasunar Forest disease, and Omsk hemorrhagic fever.
- ✓ Severe exudative pharyngitis is a characteristic early feature of Lassa fever.

☐ **Screening**

Contact Public Health for patients with suspected VHF and the following clinical criteria:

- ◆ Fever (101°F) for less than three weeks,
- ◆ Severe illness and no predisposing factors for hemorrhagic manifestations,
- ◆ And at least two of the following hemorrhagic symptoms: hemorrhagic or purple rash, epistaxis, hematemesis, hemoptysis, blood in stools, other, and no established alternative diagnosis.

☐ **Diagnosis**

- ✓ Evaluation should include a travel history and inquiry about exposure to ticks, mosquitoes, animals, and ill persons.
- ✓ Laboratory diagnostic tests (blood/serum and other body fluids) are performed at public health labs.
 - ◆ Antigen detection by antigen-capture ELISA
 - ◆ Serology
 - ◆ RT-PCR
 - ◆ Immunohistochemistry
 - ◆ Electron microscopy.
 - ◆ Viral isolation (performed at CDC)

☐ **Infection Control**

- ✓ Airborne and contact precautions should be followed by all health care, environmental, and laboratory workers when VHF is suspected.
- ✓ Patients should be placed in a negative pressure room and dedicated medical equipment used, if available.
- ✓ Patients recovering from an arenavirus or filovirus infection should refrain from sexual activity for three months post-recovery.

☐ **Treatment**

- ✓ Treatment is primarily supportive.
 - ◆ Correct coagulopathies as needed.
 - ◆ Avoid anticoagulant therapies, anti-platelet drugs, and intramuscular injections.
 - ◆ Maintain fluid and electrolyte balance.
- ✓ Ribavirin may be available under an investigational new drug protocol for patients with arenavirus or bunyavirus infection.
- ✓ Refer to <http://www.bt.cdc.gov> for current treatment and prophylaxis guidelines.

Public Health

Seattle & King County Fact Sheet

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☐ Prophylaxis

- ✓ Persons exposed to VHF should be monitored for fever or hemorrhagic symptoms for 21 days post-exposure.
- ✓ Ribavirin may have a role in the prophylaxis of symptomatic persons exposed to arenaviruses or bunyaviruses.
- ✓ The only vaccine currently commercially available for VHF is a live-virus vaccine for yellow fever vaccine.
 - ◆ Recommended for travelers to endemic areas of South America and Africa and laboratory personnel.
 - ◆ Not useful for post-exposure prophylaxis because the time-to-immunity post-vaccination (10 days) is longer than the disease incubation period (three to six days).

- ✓ Vaccines against Argentine hemorrhagic fever and Rift Valley fever are available as investigational new drugs, and research is underway to develop vaccines against other VHF viruses.

☐ Web resources

- ✓ Centers for Disease Control and Prevention: <http://www.bt.cdc.gov>
- ✓ Public Health – Seattle & King County: <http://www.metrokc.gov>
- ✓ Infectious Disease Society of America: <http://www.idsociety.org>
- ✓ Bioterrorism preparedness training modules: <http://healthlinks.washington.edu/nwcphp/bttrain/>
- ✓ Washington Department of Health: <http://www.doh.wa.gov>

Virus family	Virus/syndrome	Geographic occurrence of natural disease	Reservoir or vector	Incubation period	Mortality
Arenaviruses	Machupo (Bolivian hemorrhagic fever) Junin (Argentine hemorrhagic fever) Guanarito (Venezuelan hemorrhagic fever) Sabia (Brazilian hemorrhagic fever)	South America	Rodents	7-16 days	15-30%
	Lassa Fever	West Africa		5-16 days	
Bunyaviruses	Crimean-Congo HF	Crimea, parts of Africa, Europe, and Asia	Ticks	3-12 days	2-50%
	Rift Valley Fever	Africa	Mosquitoes	2-6 days	<1%
	Hantaviruses	Diverse areas	Rodents	Usually 2-4 weeks	5-50%
Filoviruses	Ebola Hemorrhagic Fever Marburg Hemorrhagic Fever	Africa	Unknown	2-21 days 2-14 days	23-90%
Flaviviruses	Yellow Fever	Tropical Africa, Latin America	Mosquitoes	3-6 days	20%
	Dengue Fever	Tropical areas		3-14 days	1-50%
	Kyansur Forest Disease	India	Ticks	2-9 days	3-10%
	Omsk Hemorrhagic Fever	Siberia			0.5-10%

Report all suspected cases of viral hemorrhagic fever immediately to Public Health – Seattle & King County by calling (206) 296- 4774.